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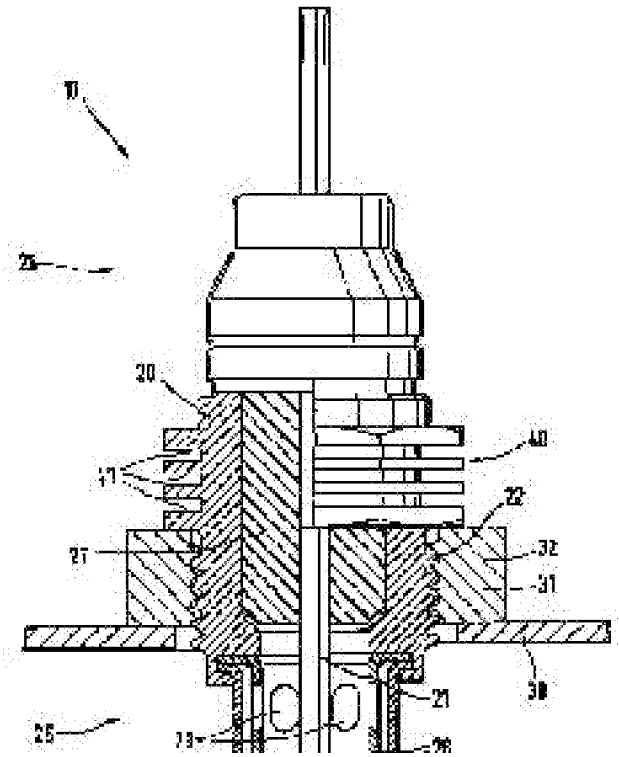
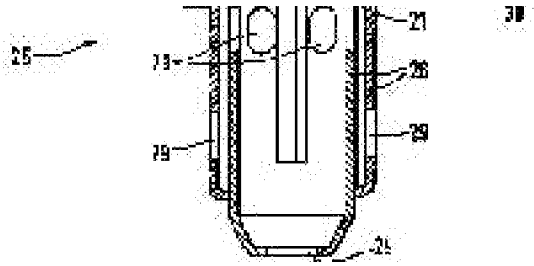
(54) GAS MEASURING SENSOR

(57)Abstract:
PROBLEM TO BE SOLVED: To prevent a casing from being heated intensely during operation in a gas measuring sensor.
SOLUTION: This gas measuring sensor is provided for measuring at least one physical value of measuring gas, particularly measuring the concentration of gas components in the exhaust gas of an internal combustion engine or measuring the temperature of the exhaust gas. The casing of the gas measuring sensor has the thread, and this thread allows the gas measuring sensor to be screwed into the corresponding thread of a measuring opening. The casing has a region with which a tool can be engaged to screw the gas measuring sensor into the corresponding thread of the measuring opening, and the



region 40 of the casing 20 is provided with at least one ring groove 41.



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[Claim(s)]
[Claim 1] It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure at least one physical value of measurement gas, and to measure the concentration of the gas constituents especially in exhaust gas of an internal-combustion engine. The casing of the gas determination sensor has a screw thread, and by this screw thread [a gas determination sensor] In the thing of form that the casing has the field which can be engaged in order that screwing to the correspondence screw thread of a measuring opening may be possible and a tool may thrust a gas determination sensor into the correspondence screw thread of a measuring opening The gas determination sensor characterized by preparing at least one ring groove (41) in said field (40) of a casing (20).
[Claim 2] The gas determination sensor according to claim 1 by which the ring groove (41) is arranged to the longitudinal direction shaft line of a casing (20) at the perpendicular plane.
[Claim 3] The gas determination sensor according to claim 1 or 2 a ring groove (41) and whose casing (20) are same axle-like.
[Claim 4] The gas determination sensor given [from Claim 1 to 3] in any 1 clause said given field (40) of a casing (20) is a hexagon object.
[Claim 5] It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure at least one physical value of measurement gas, and to measure the concentration of the gas constituents especially in exhaust gas of an internal-combustion engine. In the thing of the form in which the casing of the gas determination sensor has a ring-like color, and the fastener means which equipped this color with the screw thread is engaged and which this fastener means can thrust into the correspondence screw thread of a measuring opening The gas determination sensor characterized by preparing at least one ring groove in the fastener means.
[Claim 6] The gas determination sensor according to claim 5 whose fastener means are a hollow screw and/or a cap nut.
[Claim 7] The gas determination sensor according to claim 5 by which the fastener means has the head of the hexagon.

[Detailed Description of the Invention]

[0001]
[Field of the Invention] In order that this invention may measure at least one physical value of measurement gas, It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure the concentration of the gas constituents especially in exhaust gas of an internal-combustion engine. The casing of the gas determination sensor has a screw thread, by this screw thread, screwing to the correspondence screw thread of a measuring opening is possible for a gas determination sensor, and it is related with the thing of form that the casing has the field which can be engaged in order that a tool may thrust a gas determination sensor into the correspondence screw thread of a measuring opening. In order that this invention may measure at least one physical value of measurement gas further, It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure the concentration of the gas constituents especially in exhaust gas of an internal-combustion engine. The casing of the gas determination sensor has a ring-like color, the fastener means which equipped this color with the screw thread is engaged, and this fastener means is related with the thing of the form in which screwing to the correspondence screw thread of a measuring opening is possible.
[0002]
[Description of the Prior Art] The gas determination sensor of such a form is well-known from for example, the Federal Republic of Germany patent public presentation No. 19714203 Description. Such a gas determination sensor of form has the metal casing equipped with the measurement side edge part and the connection side edge part. The measurement side edge part of the gas determination sensor is inserted in the measurement gas chamber which is the exhaust gas pipe of an internal-combustion engine, for example. Therefore, the gas determination sensor has a hexagon object and a screw thread between the measurement side edge part and the connection side edge part, and, as a result, a gas determination sensor can be thrust into the correspondence screw thread of the measurement gas opening prepared in the exhaust gas pipe in the screw thread using the tool which engages with six angular objects. The gas determination sensor fixed to the measurement gas opening is the hexagon object, and ** arrival can be directly carried out to a measurement gas opening.
[0003] Furthermore, based on the Federal Republic of Germany patent No. 4318107 Description, a well-known gas determination sensor is fixable in the measurement gas opening of an exhaust gas pipe using a cap nut or a hollow screw. A cap nut or a hollow screw presses the color which it is prepared in the casing in this case, and is committed as a correspondence receptacle.
[0004] Exhaust gas and an exhaust gas pipe may have the temperature which exceeds 1000 degrees C during operation. A hexagon object is heated by the temperature which exceeds 600 degrees C by this. At such a temperature, in the field of a hexagon object, a gas leak (Ausgasung) may be produced in the inside of a gas determination sensor, and the function as regulation of a gas determination sensor will be spoiled by this.
[0005]
[Problem to be solved by the invention] Therefore, the technical problem of this invention improves the gas determination sensor of the form indicated in Claim 1 or the dominant conception part of Claim 5, and while a casing operates, it is made not to be heated not much strongly.
[0006]
[Means for solving problem] [the composition of this invention indicated to Claim 1 in order to solve this technical problem] It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure at least one physical value of measurement gas, and to measure the concentration of the

gas constituents especially in exhaust gas of an internal-combustion engine. The casing of the gas determination sensor has a screw thread, and by this screw thread [a gas determination sensor] In the thing of form that the casing has the field which can be engaged in order that screwing to the correspondence screw thread of a measuring opening may be possible and a tool may thrust a gas determination sensor into the correspondence screw thread of a measuring opening, at least one ring groove was prepared in said field of the casing.
[0007] moreover, [the composition of this invention indicated to Claim 5 in order to solve said technical problem] It is a gas determination sensor for measuring the temperature of exhaust gas, in order to measure at least one physical value of measurement gas, and to measure the concentration of the gas constituents especially in exhaust gas of an internal-combustion engine. The casing of the gas determination sensor has a ring-like color, the fastener means which equipped this color with the screw thread is engaged, and at least one ring groove was prepared in the fastener means in the thing of the form which this fastener means can thrust into the correspondence screw thread of a measuring opening.
[0008]
[Effect of the Invention] [the gas determination sensor by this invention constituted by the feature part of Claim 1 like a description] It has the advantage that at least one ring groove is prepared in the casing field to which a tool can be engaged in order to thrust a gas determination sensor into the correspondence screw thread of the following advantages, i.e., a measurement gas opening, compared with conventional technology. Thus, when the surface area of the field concerned increases, the heat transfer to the air which encloses a gas determination sensor is improved. During operation, this field is not heated not much strongly by this, even when exhaust gas temperature is high, but as a result, fear of effluence of gas is remarkably reduced. Furthermore, the temperature in the connection side edge part of a casing is reduced by the improved heat transfer.
[0009] The following thing is mentioned as another advantage of this invention. That is, by the gas determination sensor by this invention, the field where a tool can be engaged will have smaller mass by preparing at least one ring groove. By this, at the time of the heat treatment process (Ausheizprozess) for example, at the time of manufacture, a gas determination sensor can be quickly heated to a required temperature, and, as a result, can reduce energy and time required for the process concerned.
[0010] [moreover, the gas determination sensor by this invention constituted by the feature part of Claim 5 like a description] It has the advantage that the improved heat transfer to ambient air becomes possible, with the surface area of the fastener means which increased by establishing the following advantages, i.e., at least one ring groove, compared with conventional technology. A casing is not much strong during operation, and fastener means ****** is no longer heated by this. Therefore, also in this invention, the same advantage is acquired also in the gas determination sensor by this invention which has the composition indicated in the feature part of Claim 1.
[0011] Another advantageous composition of this invention is indicated to other claims.
[0012]
[Mode for carrying out the invention] Next, the form of operation of this invention is explained, referring to Drawings.
[0013] The gas determination sensor 10 which equipped the inside with the casing 20 by which the sensor element 21 is arranged as a work example of this invention is shown in drawing 1 . The casing 20 has measurement side Type 25 and connection side Type 26. It is being fixed with the seal package 27 in the casing 20, and simultaneously, this seal package 27 commits a sensor element 21 in order to carry

out the seal of measurement side Type 25 of a casing 20 from connection side Type 26 of a casing 20. The protective tube 28 of the double wall is being fixed to measurement side Type 25 of a casing 20, and this protective tube 28 has the opening 29 which enables the inflow of the measurement gas to a sensor element 21.

[0014] As for the gas determination sensor 10, measurement side Type 25 and protective tube 28 of the casing 20 have entered in the exhaust gas pipe 30 of an internal-combustion engine. Since the gas determination sensor 10 is fixed to the exhaust gas pipe 30, the screw thread 22 is formed in the casing 20, and the gas determination sensor 10 is thrust into the correspondence screw thread 31 of the measuring opening 32 of the exhaust gas pipe 30 by this screw thread 22. In order to add torque required for screwing, a screw thread 22 is adjoined at a casing 20, six angular objects 40 are formed, and for example, a hexagon spanner can be engaged with this hexagon object 40.

[0015] Three ring grooves 41 are formed in the hexagon object 40 to the longitudinal direction shaft line of a casing 20 at the perpendicular plane. These ring grooves 41 and casings are same axle-like. The bore of the casing 20 in the field of the hexagon object 40 is about 9mm, and the outer diameter (minimum) of six angular objects 40 is about 21mm. The depth of the ring groove 41 is about 3mm, and the interval between the ring groove 41 and the inside of a casing 20 is about 3mm similarly. The stability of a casing 20 is not spoiled by this by the ring groove 41.

[0016] The width of the ring groove 41 is about 1mm. When choosing ** of a ring groove, as a result the number of ring grooves, you have to take the following thing into consideration. That is, if the number of ring grooves increases, surely surface area will increase, but based on width becoming small, air circulation will deteriorate by many ring grooves. In the work example of illustration, the best heat transfer can be obtained by three ring grooves 41. Compared with a gas determination sensor without a ring groove, 35 degrees C of temperature of a hexagon object is reduced, and becomes about 550 degrees C. When choosing the width of a ring groove, you have to take the following thing into consideration further. That is, as for the width of a ring groove, it is desirable that it is the half of the width of the tool which engages with a hexagon object at the maximum.

[0017] In the another work example by this invention which is not illustrated, the casing of the gas determination sensor has ring-like a color, a fastener means, for example, a cap nut, or a hollow screw. Since a gas determination sensor is fixed, a fastener means is put and inserted in a gas determination sensor, and is thrust into the measuring opening of an exhaust gas pipe. In this case, the color of a gas determination sensor is committed as ****** for a fastener means. The ring groove is prepared outside at the fastener means, and the heat transfer to ambient air is improved by these ring grooves. The size of the ring groove in a fastener means is performed in accordance with the standard same in the work example described above.

[0018] a ring groove -- for example, turning -- the hexagon object 40 -- or it can be prepared in a fastener means.

[Brief Description of the Drawings]

[Drawing 1] It is the figure in which carrying out the section of the one work example of the gas determination sensor by this invention partially, and showing it.

[Explanations of letters or numerals]

10 Gas Determination Sensor 20 Casing 21 Sensor Element, 22 Screw Thread 25 The Measurement Side Type 26 The Connection Side Type 27 Seal Package 28 Protective Tube 29 Opening 30 Exhaust Gas Pipe 31 Correspondence Screw Thread 32 Measuring Opening 40 Six Angular Objects 41 Ring Groove

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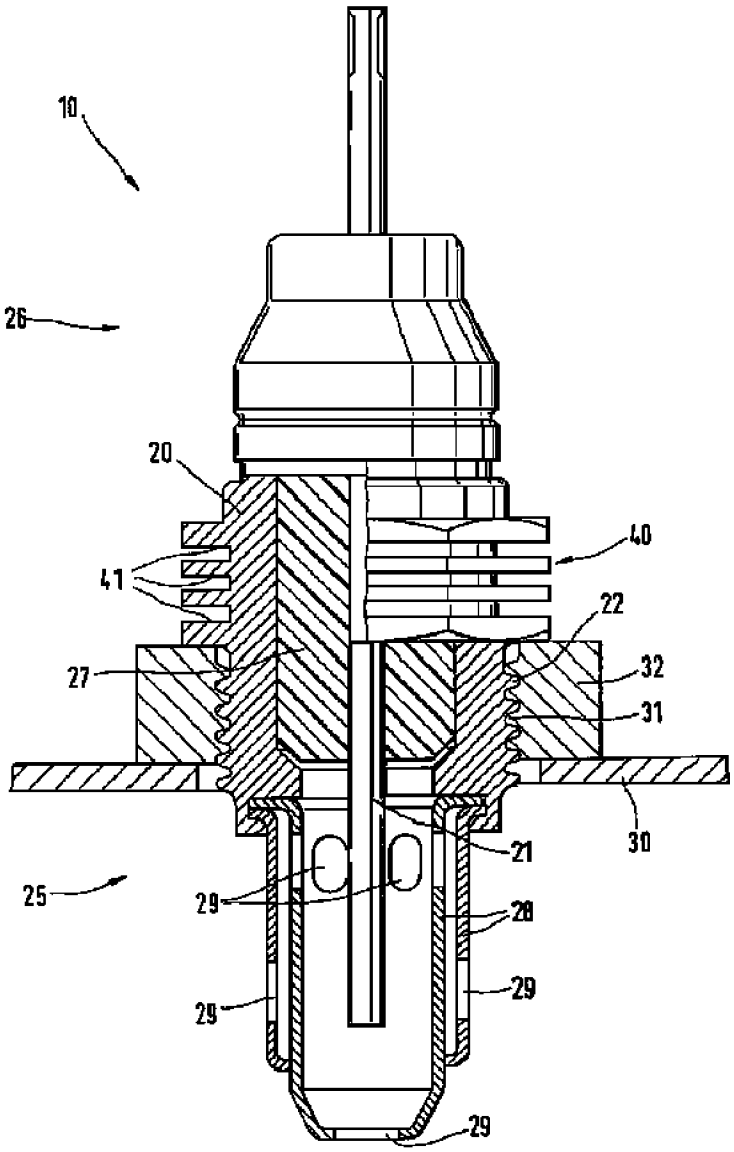
[Drawing 1]



[Translation done.]